

ZEYU (JERRY) WEI

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RESEARCH INTERESTS

Machine Learning, Topological Data Analysis, Network Analysis, Nonparametric Statistics

EDUCATION

University of Washington, Seattle

09/2019-Present

Ph.D., Statistics

Advisor: Yen-Chi Chen, Tyler H. McCormick

Core Coursework: Machine Learning for Big Data, Machine Learning Theory, Data Visualization, Network Analysis, Statistical Consulting, Advanced Statistical and Probability Theory

University of Wisconsin – Madison, B.S.

09/2015-05/2019

Major in **Statistics** (Honor), **Math** (Honor), **Sociology** (Concentration in Analysis and Research)

Certificate in **Computer Science**

TECHNICAL SKILLS

Proficient in R, Python, MATLAB, SQL

Familiar with Java, C++, Spark, AWS, Mathematica, Altair, Vega-Lite, D3.js, Excel

RESEARCH & EXPERIENCE

Graph-Assisted Learning Methods on Data Manifolds

Skeleton Regression: A Graph-Based Approach to Estimation on Manifold

Advisor: Yen-Chi Chen (UW Stats)

08/2021-Present

- Propose a novel regression framework to deal with covariates lying around low-dimensional manifold structures with noises (R package [\[link\]](#) and Python implementation [\[link\]](#))

Skeleton Clustering: Dimension-Free Density-Aided Clustering

12/2019-07/2022

- Propose a clustering framework on large-scale high-dimensional data, via new density-aided similarity measures that avoids the curse of dimensionality.
- Developed R package [\[link\]](#) and created interactive visualizations [\[link\]](#)

Sparse Subspace Clustering (Preliminary Exam Project)

03/2020-06/2020

Characterizing Networks with Applications in Disease Modeling and Social Policies

Epidemic Model Failures under Missingness

Advisors: Tyler McCormick (UW Stats & Sociology), Arun Chandrasekhar (Stanford Econ), Paul Goldsmith-Pinkham (Yale Management)

09/2021-Present

- Analyze the performance of epidemic models under inaccurate graph with missingness
- Investigate how geometric properties of networks affect the impact of missingness

On the Translates of General Dyadic Systems on R

Advisors: Theresa C. Anderson (UW-Madison & Purdue Math)

05/2018-07/2018

- Generalized the notion of distinct dyadic system and proved classification criteria

Change in Distance to Nearest Abortion Facility in Wisconsin, 2010 to 2017

Advisor: Jason Fletcher (UW-Madison Sociology)

01/2018-05/2018

Zeyu (Jerry) Wei

Projects on Financial and Healthcare Data

The Effects of Noise Exposure and Aging on the Acoustic Reflex in Normal-Hearing People

PI: Ward R Drennan (UW Otolaryngology)

01/2020- 08/2020

- Apply Mixed Effects Models to identify indicators of subclinical hearing problems with experimental Audiology data

Model Maxima Series with Autoregressive Conditional Fréchet Model (financial statistics)

Advisor: Zhengjun Zhang (UW-Madison Stats)

07/2018-05/2019

- Modeling maximum stock prices by incorporating dynamic components into a generalized extreme value model

Applying Cluster-Boosted Regression to Secure Confidential Data and to Improve Predictions

Advisor: Mark Chignell (UToronto Engineering)

07/2018-08/2018

- Wrote report on cluster-boosted regression as part of the Fields Summer Research Program

PUBLICATIONS

Journal Publications

- [1] **Wei, Z.**, Chen, Y. (2023) *Skeleton Clustering: Dimension-Free Density-Aided Clustering*, Journal of the American Statistical Association (**Top Statistics journal**)
- [2] **Wei, Z.**, Chen, Y. *Skeleton Regression: A Graph-Based Approach to Estimation on Manifold* (manuscript under revision)
- [3] Anderson, T.C., Hu, B., Jiang, L., Olson, C., **Wei, Z.** *On the translates of general dyadic systems on R* . Mathematische Annalen. 377, 911–933 (2020). (**Top Math journal**)

Conferences

- [4] **Wei, Z.**, Chen, Y. *Skeleton Clustering: Graph-Based Approach for Dimension-Free Density-Aided Clustering*, NeurIPS 2022 Workshop, New Frontiers in Graph Learning
- [5] **Wei, Z.**, Chen, Y. *Skeleton Regression: A Graph-Based Approach to Estimation on Manifold*, Symposium on Data Science & Statistics, 2022
- [6] Drennan, W., Langley, L., **Wei, Z.** *The Effects of Noise Exposure and Aging on the Acoustic Reflex in Normal-Hearing People*, 182nd Meeting of the Acoustical Society of America, 2022
- [7] **Wei, Z.**, Chen, Y. *Skeleton Clustering: Dimension-Free Density-Based Clustering*, Joint Statistical Meeting 2021
- [8] Zhang, Z., **Wei, Z.** *Autoregressive Conditional Fréchet (AcF) Model*, Undergraduate Symposium at the University of Wisconsin-Madison, 2019
- [9] Anderson, T.C., Hu, B., Jiang, L., Olson, C., **Wei, Z.** *On the translates of general dyadic systems on R* , Undergraduate Mathematics Symposium, University of Illinois at Chicago, 2018

Technical Reports

- [10] Fletcher, J., Madden, J., Romell, E., **Wei, Z.** (2018). *Change in Distance to Nearest Abortion Facility in Wisconsin, 2010 to 2017*.
- [11] Chignell, M., **Wei, Z.**, Cheng, F., Li, Y. (2017) *Effectiveness of Cluster-Boosted Regression*

HONORS & AWARDS

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|---------------------------------------------------------------------------|------|
| • Student & Early Career Travel Award by American Statistical Association | 2022 |
| • Graduate Student Conference Presentation Award by UW Graduate School | 2022 |
| • GPSS Travel Grant by UW Graduate & Professional Student Senate | 2022 |
| • R. Creighton Buck Scholarship | 2019 |

SERVICES & VOLUNTEERS

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| -Organizer of the Geometric Data Analysis Reading Group, UW Statistics | 10/2021-Present |
| -Lead Tutor, coordinating tutoring service provided by UW Statistics department | 09/2021-Present |
| -Teaching Assistant: Machine Learning, Stochastic Process, Intro to Statistics | 09/2019-Present |

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